

WHAT IS CLAIMED IS:

1. A cementitious material having a total mass, the cementitious material comprising:
 - a cement having a cement mass;
 - an aggregate having an aggregate mass, the cement mass and the aggregate mass having a combined mass of about 80 to 95 percent of the total mass;
 - a pozzolan composition comprising at least one of a silica fume and a metakaolin, the pozzolan composition being present in an amount of about 4.0 to 6.0 percent of the total mass; and
 - an acrylic polymer composition.
2. A cementitious material as recited in claim 1, wherein the pozzolan composition is present in an amount of about 4.0 to 4.5 percent of the total mass.
3. A cementitious material as recited in claim 1, wherein the pozzolan composition is present in an amount of about 4.2 to 4.5 percent of the total mass.
4. A cementitious material as recited in claim 1, wherein the pozzolan composition comprises a white silica fume.
5. A cementitious material as recited in claim 1, wherein the pozzolan composition comprises a black silica fume.
6. A cementitious material as recited in claim 1, wherein the pozzolan composition comprises a gray silica fume.
7. A cementitious material as recited in claim 1, wherein

the pozzolan composition comprises a metakaolin.

8. A cementitious material as recited in claim 1, wherein the acrylic polymer composition comprises an acrylic polymer and an anti-foaming agent.

9. A cementitious material as recited in claim 1, wherein the acrylic polymer composition is present in an amount of 1 to 4 percent of the total mass.

10. A cementitious material as recited in claim 1, wherein the acrylic polymer composition is present in an amount of about 1.5 to 2.5 percent of the total mass.

11. A cementitious material as recited in claim 1, wherein the acrylic polymer composition is present in an amount of about 2.0 percent of the total mass.

12. A cementitious material as recited in claim 1, wherein the acrylic polymer is in a solid state.

13. A cementitious material as recited in claim 1, further including a colored particle component consisting essentially of at least one of quartz particles and ceramic particles.

Example 1

14. A cementitious material as recited in claim 1, wherein the pozzolan composition consists essentially of:

a metakaolin in an amount of about 2.5 percent of the total mass; and

a white silica fume in an amount of about 2.0 percent of the

total mass.

Example 2

15. A cementitious material as recited in claim 1, wherein the pozzolan composition consists essentially of a white silica fume in an amount of about 4.5 mass percent of the total mass.

Example 4

16. A cementitious material as recited in claim 1, wherein the pozzolan composition consists essentially of:

a gray silica fume in an amount of about 3.0 percent of the total mass; and

a black silica fume in an amount of about 1.0 percent of the total mass.

Example 5

17. A cementitious material as recited in claim 1, wherein the pozzolan composition consists essentially of:

a gray silica fume in an amount of about 2.7 percent of the total mass; and

a black silica fume in an amount of about 1.5 percent of the total mass.

Example 6

18. A cementitious material as recited in claim 1, wherein the pozzolan composition consists essentially of a black silica fume in an amount of about 4.2 percent of the total mass.

Independent Claim based upon Cement Mass

19. A cementitious material having a total mass, the cementitious material comprising:

a cement having a cement mass;

an aggregate having an aggregate mass,

a pozzolan composition comprising at least one of a silica fume and a metakaolin, the pozzolan composition having a pozzolan mass which is about 10 to 20 percent of the combination of the cement mass and the pozzolan mass; and

an acrylic polymer composition.

20. A cementitious material as recited in claim 19, wherein the cement mass and the aggregate mass have a combined mass amount of about 80 to 95 percent of the total mass.

21. A cementitious material as recited in claim 19, wherein the pozzolan mass is about 12 to 15 percent of the combination of the cement mass and the pozzolan mass.

22. A cementitious material as recited in claim 19, wherein the mass of the acrylic polymer composition comprises about 2 to 10 percent of the combination of the cement mass and the pozzolan mass.

23. A cementitious material as recited in claim 19, wherein the mass of the acrylic polymer composition comprises about 3 to 7 percent of the combination of the cement mass and the pozzolan mass.

24. A cementitious material as recited in claim 19, wherein the mass of the acrylic polymer composition comprises about 5.0 to 5.5 percent of the combination of the cement mass and the pozzolan mass.

Admixture

25. An admixture for use with a cementitious material having a cement mass and a total mass, the admixture comprising:
a pozzolan composition comprising at least one of a silica fume and a metakaolin; and
an acrylic polymer composition.

26. An admixture as recited in claim 25, wherein the pozzolan composition is present in an amount relative to the acrylic polymer composition of about 2 to 1 based upon mass.

27. An admixture material as recited in claim 25, wherein the pozzolan composition consists of about 68 to 71 percent by mass of the combined masses of the pozzolan composition and the acrylic polymer composition.

28. An admixture as recited in claim 25, wherein the pozzolan composition comprises a white silica fume.

29. An admixture as recited in claim 25, wherein the pozzolan composition comprises a black silica fume.

30. An admixture as recited in claim 25, wherein the pozzolan composition comprises a gray silica fume.

31. An admixture as recited in claim 25, wherein the pozzolan composition comprises a metakaolin.

Example 1

32. An admixture as recited in claim 25, wherein the pozzolan composition consists essentially of a metakaolin and a white silica fume present in about a 1 to 1 ratio by mass.

Example 4

33. An admixture as recited in claim 25, wherein the pozzolan composition consists essentially of a gray silica fume and a black silica fume present in a ratio by mass of 3 parts gray silica fume to 1 part black silica fume.

Example 5

34. An admixture as recited in claim 25, wherein the pozzolan composition consists essentially of a gray silica fume and a black silica fume present in a ratio by mass of about 2 parts gray silica fume to 1 part black silica fume.

35. An admixture as recited in claim 34, wherein the gray silica fume constitutes about 65% of the combined mass of the gray silica fume and the black silica fume.

36. An admixture as recited in claim 25, wherein the acrylic polymer composition comprises an acrylic polymer and an anti-foaming agent.

METHOD

37. A method for making a cementitious material having a total mass, the method comprising:

a first step of combining a cement having a cement mass with a pozzolan composition comprising at least one of a silica fume and a metakaolin and mixing to make a cement mixture, the pozzolan composition being present in an amount of about 4.0 to 6.0 percent of the total mass;

a second step of adding an acrylic polymer composition to the cement mixture; and

a third step of adding an aggregate having an aggregate mass to the cement mixture, so that the cement mass and the aggregate mass have a combined mass of about 80 to 95 percent of the total mass.

38. A method as recited in claim 37, wherein the first, second and third steps are performed sequentially.

39. A method material as recited in claim 37, wherein first step includes adding the pozzolan composition in an amount of about 4.0 to 4.5 percent of the total mass.

40. A method as recited in claim 37, wherein the first step includes adding the pozzolan composition in an amount of about 4.2 to 4.5 percent of the total mass.

41. A method as recited in claim 37, wherein the pozzolan composition comprises a white silica fume.

42. A method as recited in claim 37, wherein the pozzolan composition comprises a black silica fume.

43. A method as recited in claim 37, wherein the pozzolan composition comprises a gray silica fume.

44. A method as recited in claim 37, wherein the pozzolan composition comprises a metakaolin.

45. A method as recited in claim 37, wherein the acrylic polymer composition comprises an acrylic polymer and an anti-foaming agent.

46. A method as recited in claim 37, wherein the second step includes adding the acrylic polymer composition in an amount of 1 to 4 percent of the total mass.

47. A method as recited in claim 37, wherein the second step includes adding the acrylic polymer composition in an amount of about 1.5 to 2.5 percent of the total mass.

48. A method as recited in claim 37, wherein the second step includes adding the acrylic polymer composition in an amount of about 2.0 percent of the total mass.

49. A method as recited in claim 37, wherein the second step includes adding the acrylic polymer as a solid state material.

50. A method as recited in claim 37, further including a fourth step of adding a colored particle component consisting essentially of at least one of quartz particles and ceramic

particles to the cement mixture.

Example 1

51. A method as recited in claim 37, wherein the first step includes adding the pozzolan composition in the form of a metakaolin in an amount of about 2.5 percent of the total mass and a white silica fume in an amount of about 2.0 percent of the total mass.

Example 2

52. A method as recited in claim 37, wherein the first step includes adding the pozzolan composition in the form of a white silica fume in an amount of about 4.5 mass percent of the total mass.

Example 4

53. A method as recited in claim 37, wherein the first step includes adding the pozzolan composition in the form of a gray silica fume in an amount of about 3.0 percent of the total mass and a black silica fume in an amount of about 1.0 percent of the total mass.

Example 5

54. A method as recited in claim 37, wherein the first step includes adding the pozzolan composition in the form of a gray silica fume in an amount of about 2.7 percent of the total mass and a black silica fume in an amount of about 1.5 percent of the

total mass.

Example 6

55. A method as recited in claim 37, wherein the first step includes adding the pozzolan composition in the form of a black silica fume in an amount of about 4.2 percent of the total mass.

Independent Claim Based Upon Cement Mass

56. A method for making a cementitious material having a total mass, the method comprising:

a first step of combining a cement having a cement mass with a pozzolan composition comprising at least one of a silica fume and a metakaolin and mixing to make a cement mixture, the pozzolan composition having a pozzolan mass which is about 10 to 20 percent of the combination of the cement mass and the pozzolan mass;

a second step of adding an acrylic polymer composition to the cement mixture; and

a third step of adding an aggregate having an aggregate mass to the cement mixture.

57. A method as recited in claim 56, wherein the first, second and third steps are performed sequentially.

58. A method as recited in claim 56, wherein the cement mass and the aggregate mass have a combined mass amount of about 80 to 95 percent of the total mass.

59. A method as recited in claim 56, wherein the first step includes adding the pozzolan composition in an amount so that the pozzolan mass is about 12 to 15 percent of the combination of the cement mass and the pozzolan mass.

60. A method as recited in claim 56, wherein the second step includes adding the acrylic polymer composition so that the mass of the acrylic polymer composition is about 2 to 10 percent of the combination of the cement mass and the pozzolan mass.

61. A method as recited in claim 56, wherein the second step includes adding the acrylic polymer composition so that the mass of the acrylic polymer composition is about 3 to 7 percent of the combination of the cement mass and the pozzolan mass.

62. A method as recited in claim 56, wherein the second step includes adding the acrylic polymer composition so that the mass of the acrylic polymer composition is about 5.0 to 5.5 percent of the combination of the cement mass and the pozzolan mass.